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A CLEANER FOR REMOVING INSECTS FROM RAISINS

Prepared by
Stored-Product Insects Section

Raisins are exposed to infestation with the raisin moth for a considerable time and at a number of locations before they are finally processed and packaged. Each segment of the dried-fruit industry--growers and processors--must assume responsibility for carrying out the required preventive and control measures against insects if high quality in the product is to be maintained. If one fails to do an effective job, the benefits resulting from the efforts of all the others are reduced or lost completely.

The cleaner described in this publication is recommended as an aid in meeting the difficult problem of infestation and contamination by the raisin moth. The work on which this report is based is part of a broad program of research to reduce the cost of marketing farm products, including the cost of controlling insect infestation in raisins.

While the raisins are drying in the vineyard, raisin moths may lay eggs on them. By the time the raisins are ready to be boxed for storage, eggs will have hatched and the larvae, or worms, will be present. The raisins should be fumigated in the storage yard as described in another U. S. Department of Agriculture publication, AMS-131, "Enclosures for Fumigating Stored Raisins." This applies to storage either in the ranch yard or the receiving yard. Fumigation kills off any existing infestation and prevents the development of large numbers of the insects. Repeated fumigations are required during a long storage period.

THE INSECT PROBLEM

In seasons when the infestation hazard is great during the drying period, or when there is some delay in preparing the stack covers and applying the fumigation, a considerable number of larvae may be present. After fumigation these dead larvae remain in the raisins during storage. Despite the cleaning given the raisins during processing, fragments of these dead larvae may be embedded in or adhere to the raisins and go into the packaged product. Such a product is subject to seizure by the Food and Drug Administration. Furthermore, raisins infested with either dead or living

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insects, even in the storage yard while awaiting processing, may be subject to seizure or condemnation. Everyone concerned must, therefore, do all he can to keep raisins as free of insect infestation as possible.

USING A RAISIN CLEANER

Running the raisins through a cleaner with a shaker screen, just before they are boxed for storage, is a highly effective way of removing a raisin moth infestation. This cleaning should be done on the ranch and should be used as a supplement to fumigation, not as a substitute.

Besides reducing insect infestation, this cleaning operation will remove sand, soil, and debris which would otherwise become embedded in the raisins and cause additional contamination.

In one of the cooperative tests by the Stored-Product Insects Section and the Dried Fruit Association of California, about a ton of raisins was run through the cleaner. Some contained as many as seven raisin moth larvae per pound. Not a single larva could be found in the cleaned raisins. It is not likely that such complete elimination of larvae could always be obtained under all conditions of use. Proper operation of the machine, however, will assure effective cleaning.

ESSENTIAL PARTS OF THE CLEANER

Two views of the cleaner are given in figures 1 and 2. A number of the construction details can be arranged in any one of several different ways and still be functionally effective. The critical points for proper operation are discussed here.

The shaker screen is 84 inches long and 26 inches wide. The frame has walls 9 inches high across the intake end and along both sides. The upper, or intake, end is attached to a crankshaft with a 2-inch stroke. The lower, or outlet, end is mounted on oak vibrator strips; this end has no vertical movement. When the crankshaft is in the center position of the vertical stroke, the screen slopes about 1 foot in 7 feet of length. Two 1 1/2-inch wooden baffles divide the screen lengthwise into three equal sections.

In operation a thin sheet of raisins should flow steadily from intake to outlet, passing over the wooden baffles.

The screen itself is heavy wire hardware cloth with 4 meshes to the inch. The openings in the screen are approximately 6/32-inch in size. This size of opening has been found most suitable after considerable use by both industry and research men. It is small enough to hold back Thompson Seedless raisins but permit insects and debris to pass through.

The shaker is operated by a 1-horsepower motor, and the crankshaft should be geared to run at 450 r.p.m.

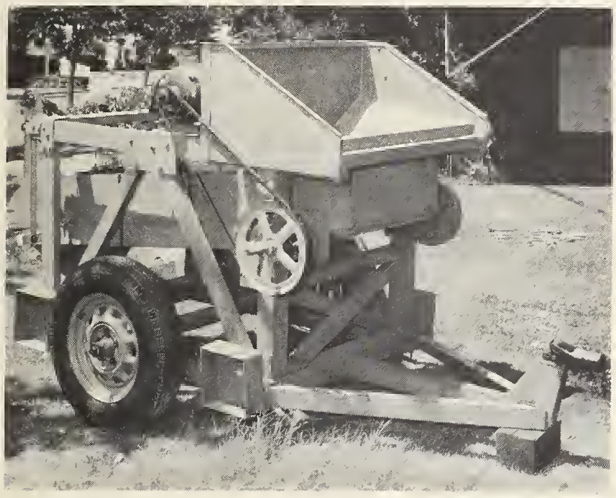

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Figure 1.--Raisin cleaner, showing intake end, hopper, motor, and drive shaft. The hollow steel blocks on each corner are folded downward to support the machine when in operation.

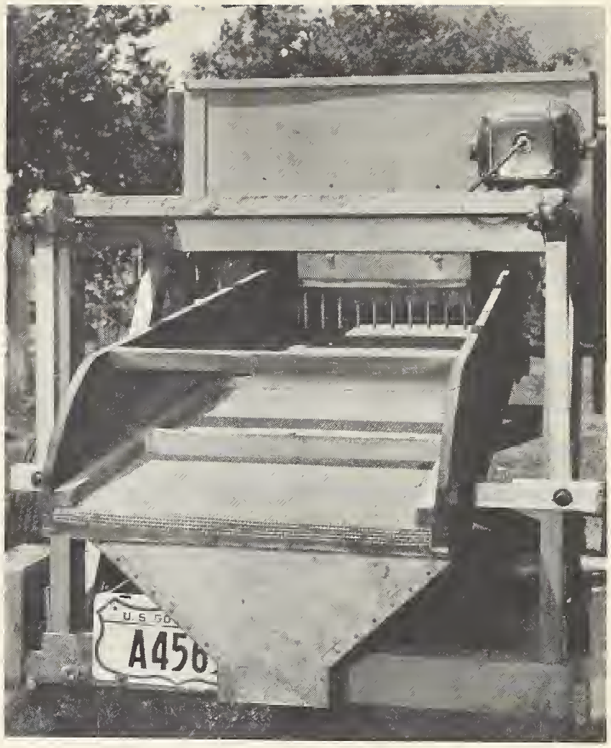

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Figure 2.--Raisin cleaner, showing outlet end of screen, wooden baffles, and (below) outlet of the trash pan beneath the screen.

SUGGESTIONS

1. Cure raisins thoroughly before screening. High-moisture raisins can be damaged seriously by screening.
2. Handle raisins carefully and avoid excessive pressure that would remove capstems or cause mechanical damage.
3. Use clean boxes for screened raisins. Be sure the boxes are not infested with insects. Fumigate them before use if necessary.
4. Clean the screen with a wire brush whenever necessary during operation. The insects will not pass through the screen if the wire becomes coated to the extent that openings are clogged or appreciably reduced in size.
5. Destroy insects removed by the cleaner or remove the cleanings to a location where they will not be an infestation hazard.
6. Keep clean boxes and screened raisins a safe distance from the cleaner to prevent screened insects from crawling to them.
7. Within 48 hours after screening, sooner if possible, deliver the raisins to the packer or place them under a fumigation cover if they are to be stored on the ranch. They will become reinfested if left exposed.
8. Fumigate raisins stored on the ranch, even though they are screened after harvest.

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